UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202 – 2733

April 10, 2019

Mr. Miguel Montoya
Quality Assurance Officer
New Mexico Environment Department
Surface Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Dear Mr. Montoya:

We have reviewed the Quality Assurance Project Plan (QAPP) entitled "*Dalton Canyon Creek*" for Clean Water Act 319 Cooperative Agreement C6-996101-18. I am pleased to inform you that it was approved on April 9, 2019.

This new QAPP will expire on April 9, 2022. Although you requested an expiration date into fall 2022 the maximum approval time is three years from the date of approval. You may submit an extension request close to the expiration date. Should there be any changes to the QAPP at any time, please submit a revised document to EPA for approval, and at that time we can modify the expiration date as well. If the project continues under a new cooperative agreement and there are no substantive technical or programmatic changes, please submit a letter stating that no changes are needed. The letter or revised document is due at least 60 days prior to the expiration date.

Attached is the completed QAPP signature page for your records. In any future correspondence relating to this QAPP, please reference QTRAK #19-233. If you have any questions, you may contact me at (214) 665-2773.

Sincerely,

Leslie C. Rauscher

Leslie Rauscher
Project Officer
State/Tribal Programs Section

Attachment; sent via email, no hardcopy to follow.

Group A: PROJECT MANAGEMENT

A.1 Title and Approval Sheet

Quality Assurance Project Plan

Dalton Canyon Creek Water Quality Improvement Project

Submitted by:

New Mexico Environment Department
Surface Water Quality Bureau

APPROVAL SIGNATURES

John Moeny
Project Officer, SWQB — 2/21/2019
Date

Miguel Montoya
Quality Assurance Officer, SWQB — 2/21/2019
Date

Abraham Franklin
Program Manager, SWQB — 2/21/2019
Date

Leslie Rauscher, Project Officer, WQPD, EPA Region 6 — 4/9/19
Date

Curry Jones
Chief, WQPD, EPA Region 6 — 4/9/19
Date

THIS PAGE INTENTIONALLY LEFT BLANK

A.2 Table of Contents

Table of Contents

Table of Figures

Table of Tables

ACRONYMS

ACOE	United States Army Corps of Engineers
DQO	Data Quality Objectives
EPA	United States Environmental Protection Agency
NMED	New Mexico Environment Department
QA	Quality Assurance
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
SOP	Standard Operating Procedures
SWQB	Surface Water Quality Bureau
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
UPWA	Upper Pecos Watershed Association
WQPD	Water Quality Protection Division

A.3 Distribution List

Table 1 below contains the distribution list, and project roles and responsibilities for this project. The QA Officer (QAO) will ensure that copies of this QAPP and any subsequent revisions are distributed to individuals who have signature authority to approve this QAPP. The SWQB Project Officer will ensure that copies of the approved QAPP and any subsequent revisions are distributed to all other project personnel listed in Table 1. All members of the distribution list who do not have signature authority to approve this QAPP will review the QAPP and sign the Acknowledgment Statement prior to initiating any work for this project. The signed Acknowledgement Statements (electronic or hard copy) will be collected by the SWQB Project Officer and will be given to the QAO for filing with the original approved QAPP.

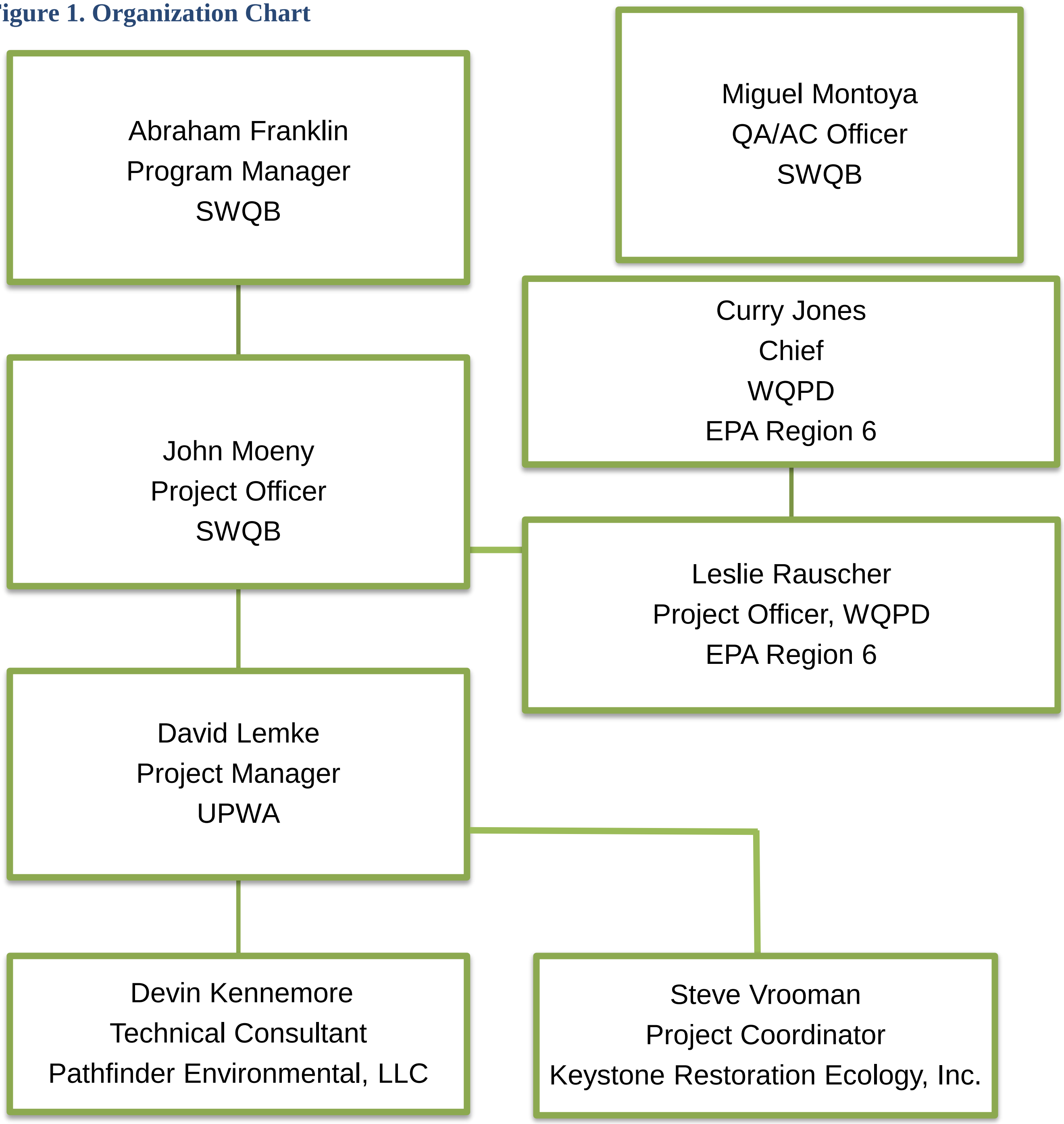
Table 1. Distribution List, Project Roles, and Responsibilities

Name	Organization	Title/Role	Responsibility	Contact Information
Abraham Franklin	SWQB	Program Manager	Reviewing and approving QAPP, managing project personnel and resources	(505) 827-2793 Abraham.franklin@state.nm.us
Miguel Montoya	SWQB	QAO	Reviewing and approving QAPP	(505) 476-3794 Miguel.Montoya@state.nm.us
John Moeny	SWQB	Project Officer	Preparing QAPP, project reporting, coordinating with contractors, EPA reporting	(575) 388-1934 John.Moeny@state.nm.us
David Lemke	UPWA	Project Manager	Project oversight	(713) 502-1809 dlemke@sbcglobal.net
Devin Kennemore	Pathfinder Environmental, LLC	Technical Consultant	Field monitoring, data collection, record keeping, and submitting reports	(505) 699-5175 devin@pathfinderenvironmental.com
Steve Vrooman	Keystone Restoration Ecology, Inc.	Project Coordinator	Project design and implementation, construction oversight	(505) 490-0594 stevevrooman@gmail.com
Leslie Rauscher	EPA	Project Officer WQPD, Region 6	Reviewing and approving QAPP	(214) 665-2773 rauscher.leslie@epa.gov
Curry Jones	EPA	Chief WQPD, Region 6	Reviewing and approving QAPP	(214) 665-6793 jones.curry@epa.gov

A.4 Project Organization

The SWQB Quality Management Plan (NMED/SWQB 2018) documents the independence of the Quality Assurance Officer (QAO) from this project. The QAO is responsible for maintaining the official approved QAPP. Figure 1 presents the organizational structure for the Dalton Canyon Creek Water Quality Improvement Project.

Figure 1. Organization Chart



A.5 Problem Definition/Background

The purpose of this Quality Assurance Project Plan (QAPP) is to define the methodology for monitoring the effectiveness of the Dalton Canyon Creek Water Quality Improvement Project. This QAPP refers to the project as the "Dalton Canyon Creek Project." The Dalton Canyon Creek Project is being managed by the Upper Pecos Watershed Association (UPWA).

EPA funding under Section 319 of the Clean Water Act provides resources to implement activities described in the document: *New Mexico Nonpoint Source Management Plan, 2014*. The plan states, "The SWQB established an effectiveness monitoring program in 2008, with the goal of documenting effects on water quality resulting from projects implemented with Section 319 funds, or '319 Projects.'" Section 7.3 of the plan, titled *Program Effectiveness Monitoring*, states that "effectiveness monitoring will be conducted within each selected project area at least twice (before and after project implementation) in a three year period."

This QAPP is a companion document to the SWQB QMP (*Surface Water Quality Bureau Quality Management Plan*, NMED/SWQB 2018 or most current version). The SWQB SOPs (*Standard Operating Procedures for Data Collection*, NMED/SWQB 2016a) is incorporated in the SWQB QMP by reference. All of the policies and procedures specified in the SWQB QMP will be followed for the Dalton Canyon Creek Project, unless otherwise specified.

When changes affect the scope, implementation, or assessment of the outcome, this QMP will be revised to keep project information current. The Project Officer, with the assistance of the QA Officer, will determine the effects of any changes to the scope, implementation, or assessment of the outcome on the technical and quality objectives of the project. This Project Plan will be reviewed annually by the Project Officer to determine the need for revision.

Objective

The objectives of the environmental monitoring component of the Dalton Canyon Creek Project are to assess the baseline (pre-treatment) conductivity condition of Dalton Canyon Creek and to identify the conductivity reduction in the Dalton Canyon Creek Watershed (USGS HUC 130600010205), where the restoration project will be implemented. The secondary objective of the monitoring is the assessment of erosion and sedimentation improvements over the creek as a result of implementation of the Dalton Canyon Creek Project (see Appendix for approved scope of work from Response to Proposal).

Background

The New Mexico 2018-2020 Clean Water Act Section §303(d)/§305(b) Integrated Report, Appendix B recognizes four stream segments in the Upper Pecos watershed as being impaired for specific conductivity (Table 2) with the probable sources of impairment including: pavement/impervious surfaces, inappropriate waste disposal, bridges/culverts/RR crossings, paved roads, gravel or dirt roads, highway/road/bridge runoff, angling pressure, dumping/garbage/trash/litter, dispersed campgrounds, drought-related impacts, watershed runoff following forest fire, on-site treatment systems, and residences. The specific conductance listings for these segments were first reported in the §303(d)/§305(b) Integrated Report in the year shown in the table.

Table 2. Specific conductivity impaired stream segments in the Upper Pecos watershed

Impaired stream segments	Year of first listing	Cause for impairment
Dalton Creek (Pecos River to headwaters) 8.02 miles length	2012	Specific Conductivity
Glorieta Creek (Pecos River to Glorieta Conference Center) 8.39 miles length	2004	Specific Conductivity
Macho (Pecos River to headwaters) 7.82 miles length	2012	Specific Conductivity
Willow Creek (Pecos River to headwaters) 5.8 miles length	2004	Specific Conductivity

The overarching goal of this project is to produce measurable reductions in specific conductance at the lower end of an approximately 1.5-mile-long segment of Dalton Canyon Creek (Pecos River to headwaters, AU NM-2214.A_070) and contribute to the specific conductance load reduction goals for the upper Pecos watershed outlined in the 2013 Pecos Headwaters TMDL (Table 3) (NMED/SWQB 2013a).

Table 3. Calculation of Measured Load for TDS (Specific Conductance surrogate)

Stream Reach	Target Load (lbs/day)[(a)]	Measured Load (lbs/day)	Load reduction (lbs/day)	Percent Reduction[(b)]
Dalton Canyon Creek	327.7	531.3	203.6	38
Macho Canyon Creek	418.8	569.8	151.0	26
Willow Creek	2194	2947	752.5	26

Notes:
lbs/day = Pounds per day
[(a)]Target Load = WLA + LA + MOS
[(b)]Percent reduction is the percent the existing measured load must be reduced to achieve the target load, and is calculated as follows: (Measured Load – Target Load) / Measured Load x 100

For the Dalton Canyon Creek (Pecos River to headwaters) Assessment Unit, the water quality standard for specific conductance is achieved when the target load of 327.7 lbs/day is achieved. The two factors that most directly affect specific conductance, according to the 2013 TMDL, are flow and Total Dissolved Solids (TDS). Flow and TDS are most readily addressed by implementation of the project by improving channel geomorphology and reducing erosion. These are the two main factors that will be affected by the project in the upper two-thirds (1 mile) of the project area. The total length of the Assessment Unit is 8.02 miles; therefore, assuming the sources of the specific conductivity are evenly distributed throughout the Assessment Unit, the anticipated potential load reduction in TDS as a result of this project is one-eighth of the load reduction in Table 3 for Dalton Canyon Creek.

Thus, the goal for this project is to reduce specific conductivity along a 1.5-mile long segment of Dalton Canyon Creek (Pecos River to headwaters) by 4.8 percent and to produce a corresponding estimated reduction in TDS of 25 lbs/day by 2023 (25 lbs/531 lbs × 100 = 4.8 percent). This stated goal might not be achieved until the planted vegetation along the reach matures and begins trapping sediment and reducing erosion; however (all other factors being held constant), UPWA anticipates some measurable progress will be made by 2023 that demonstrates a trend towards achievement of the specific conductivity reduction goal.

A.6 Project/Task Description

Description

The Dalton Canyon Creek Project will monitor specific conductivity and TDS. Acquisition of these data will occur before implementation of restoration activities to establish pre-treatment (baseline) conditions. Post-construction monitoring of specific conductivity and TDS will occur to determine load reductions achieved by the project. These activities will occur independently from restoration activities.

The study design consists of two conductivity and TDS monitoring sites upstream of the restoration project area and two sites downstream of the restoration project to determine reductions in specific conductance after project implementation. One of the upstream sites will be established upstream of a small residential community located just above the project area. The other upstream monitoring site will be located below this community and above the project area. One of the downstream monitoring sites will be located just below the project area and the other will be located near the mouth of the creek before it enters the Pecos River. Exact locations will be determined in the field by the Project Coordinator, Steve Vrooman, with the assistance of Technical Consultant, Devin Kennemore.

Schedule

Monitoring will be accomplished using a YSI EC300ACC-10 Conductivity Meter. This device, which is uses EPA approved method 120.1 for calculating results for conductance, is designed to provide instantaneous readings of conductivity, specific conductance, salinity, TDS, and temperature. Measurements will be taken at each established monitoring site four times each year. The first readings will be taken in April, during the normal high-flow spring runoff period.

The second will be taken in June, close to the summer zenith, when solar gain is highest and water temperatures are typically warmest. The third reading will be in August, during the typical summer rain season. The fourth and final annual readings will be taken in late September to early October, when flows are typically the lowest. These dates were intentionally selected to obtain the widest range of conditions in the creek. Readings will not be taken in the immediate 24 hour period following a storm event. Cross sections will be taken at each monitoring station as well as flow data to determine flow rates.

Table 4. Project Implementation Schedule

Task/Responsible Party	Start Date	Completion Date
1. Project Management/UPWA	January 2, 2019	December 31, 2022
2. Project Administration and Reporting/UPWA	January 2, 2019	December 31, 2022
3. Development of QAPP/Pathfinder Environmental	January 2, 2019	April 30, 2019
4. Environmental Baseline Data Collection and Monitoring/Keystone Restoration Ecology	April 1, 2019	October 15, 2019
5. Biological and Archaeological Surveys and Reporting, NEPA, CWA Permitting/Pathfinder Environmental	January 2, 2019	December 31, 2019
6. Geomorphology Survey of Reaches 1-4/Keystone Restoration Ecology	April 1, 2019	August 31, 2019
7. Project Design/Keystone Restoration Ecology	August 31, 2019	October 31, 2019
8. Meetings with USFS and affected agencies/Pathfinder Environmental, Keystone Restoration Ecology	January 2, 2019	December 31, 2019
9. On the ground implementation/Keystone Restoration Ecology	June 1, 2020	October 31, 2020
10. Post-construction monitoring for geomorphology and vegetation/Keystone Restoration Ecology	August 1, 2020	December 31, 2020
11. ACOE Monitoring Reports/Keystone Restoration Ecology	October 1, 2021	December 31, 2022
12. Post-construction water quality monitoring/Keystone Restoration Ecology	April 1, 2021	October 15, 2022
13. YCC outreach and education, willow plantings/Keystone Restoration Ecology	January 2, 2019	December 31, 2020

Project Area

The project area is located entirely on SFNF land along a 1.5-mile segment of the Dalton Canyon Creek Assessment Unit (Pecos River to headwaters, NM-2214.A_070), mostly upstream of the 2002 Dalton Fire burn area, within the 12-digit Hydrologic Unit Code (HUC) number 130600010205 (Figure 2). This priority reach is near the lower end of approximately 8 impaired stream miles in total (2016-2018 Clean Water Act Section §303(d)/§305(b) Integrated Report). This Assessment Unit encompasses 27,274 acres in total. The project area consists of approximately 1.5 mile of Dalton Canyon Creek and approximately 18 acres of land area, assuming an average 100-foot corridor width where the project will be implemented.

The upper end of the project area was submerged by beaver ponds approximately 18-20 years ago. After the beavers were eliminated, their dams eventually broke down and the creek bed began encroaching northeast toward Forest Road 123 (FR 123). At one point, following a severe storm event pushed the creek channel into the roadway and the roadway was moved uphill around the floodplain. Over time, the remnants of the old beaver ponds have grown over by riparian and mixed conifer vegetation. The original creek channel is still visible in some locations.

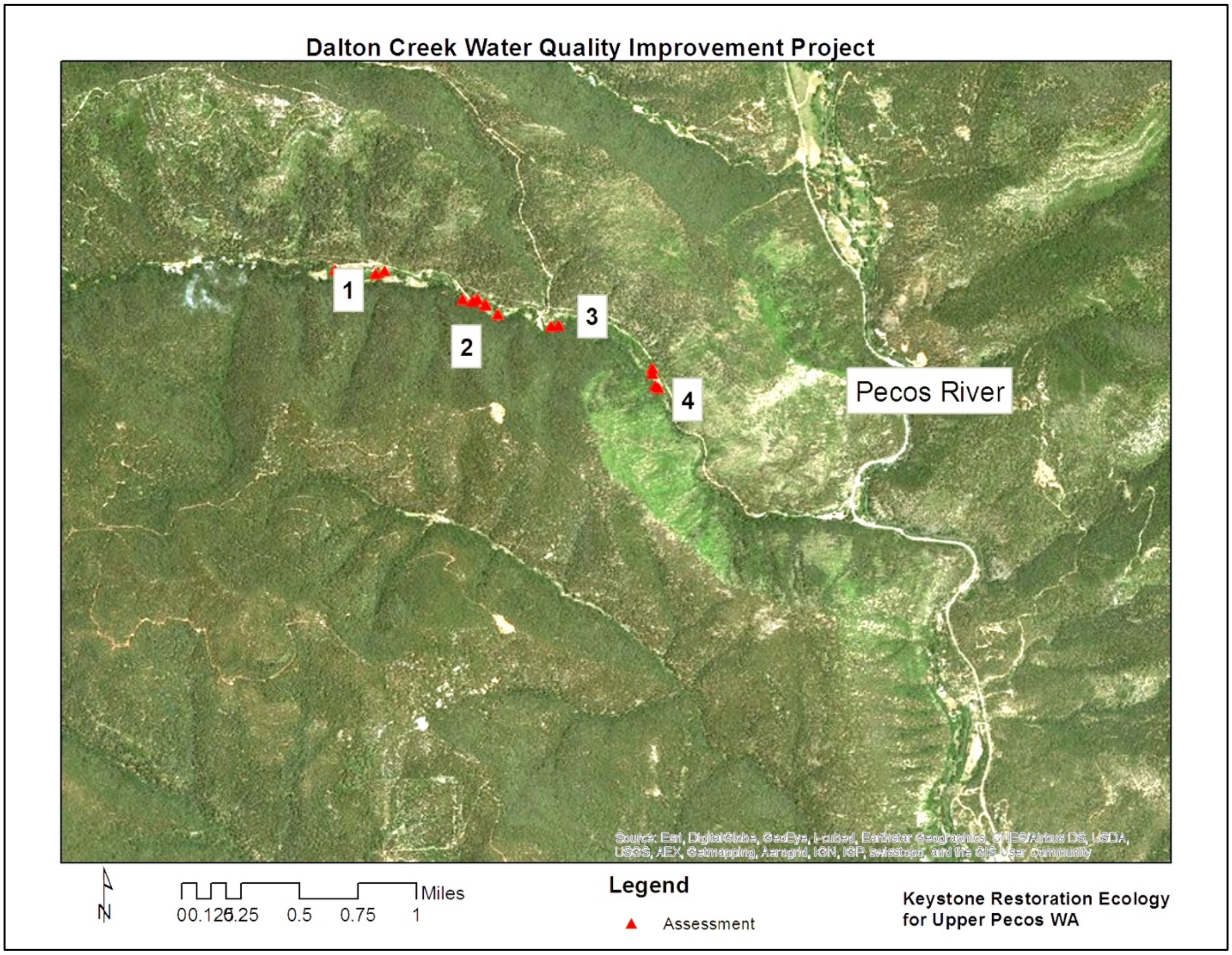


Figure 2. Dalton Canyon Creek Project Area

The middle section of the project area comprises a series of user established camping areas where campers have driven vehicles off of FR 123 and down into the floodplain. In some places they have driven across the creek. These areas have been denuded of vegetation and the soils compacted. Campfires are frequently built adjacent to the creek. Stormwater and snowmelt runoff crosses these camping areas and carries sediment directly into the creek. Previous attempts to limit vehicle access to areas close to the creek have been insufficient to accomplish the objective.

The lower section of the project area consists of forest and a few open, meadows that could easily be converted to user established campsites if members of the public were to find them accessible and attractive. Currently access is mostly blocked by boulders that were placed along the roadside, but places remain where vehicles could be driven off-road to reach these areas.

Location Selection Criteria

The Contractor's (UPWA) rationale for selecting this project was based on three considerations: First, our goal is to implement and complete an on-the-ground project that achieves some measure of specific conductivity load reduction in the Dalton Canyon Creek Assessment Unit as described in Chapter 5 – Management Measures, Restoration Techniques (pages 62-65) of the Upper Pecos WBP. The second consideration is to implement a project that will improve riparian habitat in the near-term (within the 4-year project life). Third, the Dalton Canyon Creek project area has high visibility to the public, which will be able to benefit directly from improved fishing and camping conditions. The benefits of reducing erosion along this reach using the techniques described in the Upper Pecos WBP and employed by this project would be quickly realized by the public and contribute to meeting our goals of engaging and involving the public as described in Chapter 9 – Outreach and Community Involvement of the Upper Pecos WBP (pages 107-108).

Restoration Activities

In this project, the Contractor will: 1) restore the eroding beaver pond at the upstream end of the project area; 2) restore the creek channel to a former meander; 3) regrade user established camping areas to divert runoff parallel to the creek and block vehicle traffic from driving through the creek; 4) finish blocking off meadows from off-road access and plant them with vegetation that will discourage camping; 5) engage the Youth Conservation Corps (YCC) in Pecos in the project to promote volunteerism and instill respect for the natural environment.

These activities are aimed at reducing TDS, and therefore specific conductivity, in the creek by addressing the previously mentioned probable sources of impairment, including: gravel or dirt roads, road runoff, dispersed campgrounds, drought-related impacts, and watershed runoff following forest fire. The project would not address any potential effects of on-site waste disposal systems associated with the residences upstream of the project area; however, the monitoring plan is designed to include monitoring stations immediately above and below these residences so that the data we are collecting might provide an indication as to whether or not these on-site systems are contributing to impairment of the creek.

Planting/transplanting appropriate native tree and shrub species, such as narrowleaf cottonwood and willow, in open areas along the bank will contribute to a reduction in water temperatures over time as canopy cover develops and the vegetation matures. Revegetation of eroded riparian areas with trees and native herbaceous species will also reduce stream bank erosion and attenuate flood peaks as water spreads and flows across the floodplain. Restoration of the old meander channel will raise the water table and improve the hydrologic connection between the creek and the riparian zone, which should result in higher flows later in the late summer and fall months when stream flow is lowest (and therefore TDS concentrations are highest). A higher water table will also have the beneficial effect of conifer mortality in the floodplain, which would, in turn, improve the conditions for riparian vegetation. The text on pages 62-63 (Chapter 5 – Management Measures, Restoration Techniques) of the Upper Pecos WBP describes the accrued benefits of planting native trees, shrubs, and riparian plants such as sedges, rushes, and grasses to hold soils and stabilize stream banks.

Stream Restoration Techniques – Stream channel restoration will include the use of plug and pond techniques to restore the original channel at the upstream end of the project area and reconnect the creek with the floodplain. In other areas where the bank is being eroded, the top will be laid back, the floodplain widened, native riparian vegetation will be established, and pools and riffles will be created. These improvements will have a positive beneficial effect on aquatic habitat diversity (page 63-64, Upper Pecos WBP).

Sediment Control – The benefits of planting vegetation along exposed, eroded stream banks and manipulating channel morphology also extend to more effective control of sediment production, transport, and entrainment. This is discussed on pages 64-65 of the Upper Pecos WBP. Some of the revegetation and channel restoration techniques that the Contractor will implement in the project area will eventually slow surface runoff and cause overland flows of sediment to slow across the project area's floodplains, allow the water to seep in and sediment to settle out.

Post-construction monitoring is planned for the summer of 2021-2022 on the same timeline as baseline data from 2019. These data will be examined at the end of the project and compared to the pre-treatment data from 2019 to determine the load reduction achieved by the Dalton Canyon Creek Project.

A.7 Quality Objectives and Criteria for Measurement Data

Question/Decision

The data collection and monitoring components of the Dalton Canyon Creek Project are intended to answer the following questions: 1) What is the specific conductivity reduction as a result of implementing the Dalton Canyon Creek Project in the Upper Pecos Watershed? 2) What is the TDS load reduction as a result of implementing the Dalton Canyon Creek Project in the Upper Pecos Watershed?

Stated as a decision: 1) The information gathered as part of the Dalton Canyon Creek Project will be used to determine the specific conductivity reduction resulting from implementation of the project. 2) The information gathered as part of the Dalton Canyon Creek Project will be used to determine the TDS load reduction resulting from implementation of the project.

Data Quality Objective (DQO)

The quality of the data will be adequate to provide a high level of confidence in determining specific conductivity reduction and reduction of TDS in the Dalton Canyon Creek Watershed.

Measurement Quality Objectives

The measurement quality objectives will be sufficient to achieve the Data Quality Objective (DQO) and will be in conformance with those listed in the SWQB's QMP. The Data Quality Indicators (DQI) listed in the SWQB's QMP and applicable to the data collected for this project are accuracy, precision, completeness, and sensitivity. Following the SWQB's SOP 7.0 (2015) for stream flow measurement, the manufacturer's directions for the YSI EC300A instrument calibration checks, procedures described by Radtke et al (2005) for field measurement of specific conductance will ensure the specific conductance and flow data meet the needs for the DQOs. An electronic flow meter will be used when flow rates are sufficient for that method to provide an accurate measurement. When flow rates are too low to use the electronic flow meter, an appropriate alternative method as described in the SWQB SOP 7.0 will be used. The same YSI instrument used for measuring specific conductance will simultaneously be used to measure TDS, following the manufacturer's directions. Measurement Quality Objectives (MQOs) are stated by Radtke et al (2005) for conductivity calibration checks and field sampling procedures to ensure the necessary sensitivity of the instrument, and completeness and accuracy of specific conductivity data. The MQOs for conductivity measurement that address all four DQIs are inherent in the sampling design described by Radtke et al (2005) for conductivity measurement.

A.8 Special Training/Certification

No special certification is required to implement this QAPP. Data collection and monitoring for this project will be implemented by Keystone Restoration Ecology with field assistance from Pathfinder Environmental, UPWA volunteers, and technical assistance and oversight from SWQB personnel. Volunteer assistance will be trained and supervised at all times by Keystone Restoration Ecology personnel in the field during deployment and data collection (flow, TDS, and conductivity) efforts. Devin Kennemore and Steve Vrooman both have many years of experience of collecting and recording environmental data in the field. This experience ensures that they have the ability to implement the data collection procedures properly to achieve the objectives for this project.

A.9 Documents and Records

The Project Officer will make copies of this QAPP and any subsequent revisions available to all individuals on the distribution list.

Project documents include this QAPP, field notebooks, calibration records, validation and verification records, recorded field data, records of analytical data in hard copy or in electronic form, and QC records. Also included are project interim and final reports. All field sheets will be verified before leaving the field, any data captured on a global positioning system (GPS), camera, smart phone, tablet, or laptop will be downloaded to a Keystone Restoration Ecology computer or an external hard drive at the end of each day. Copies will be made of all data and stored separately from the original data. Data will be submitted to SWQB Project Officer. Data obtained under this QAPP will also be submitted to NMED SWQB for consideration of water quality assessment purposes. These activities will be completed by Steve Vrooman of Keystone Restoration Ecology.

All digital project data will be kept in a project file on Keystone Restoration Ecology and Pathfinder Environmental laptop computers and on a separate external backup online via Pathfinder Environmental's Dropbox file system. Hard copy documents, such as field data sheets, will be kept in a project folder in a steel file cabinet in the Keystone Restoration Ecology office. These hard copy documents will be digitized and stored on Keystone Restoration Ecology and Pathfinder Environmental laptop computers and external online backup drive (see Table 5). All project data will be kept through contract completion and then turned over in full to UPWA for indefinite storage on an UPWA computer. Copies of the data will be distributed by Keystone Restoration Ecology and Pathfinder Environmental to NMED SWQB Project Officer at the end of the project in 2022 in accordance with the NMED/SWQB (2013b) Guidelines.

Table 5. Data Records for the Dalton Canyon Creek Project

Document	Form	Field Sheet Used
QAPP	Electronic (.doc) & Hard Copy	N/A
Calibration Records	Electronic (.doc) & Hard Copy	N/A
TDS Data	Electronic Excel Files	Excel form. Field data form created by Pathfinder Environmental
Conductivity Data	Electronic Excel Files	Excel form. Field data form created by Pathfinder Environmental
TDS Load Reduction Calculations	Electronic Excel files	Excel forms. Created by Pathfinder Environmental

Photos	Electronic (.jpg)	Field data form created by Pathfinder Environmental
Interim and Final Reports	Electronic (.doc) & Hard Copy	N/A

Group B: DATA GENERATION AND ACQUISITION

B.1 Sampling Design

Waterbody attributes and monitoring station locations for the Dalton Canyon Creek Project are presented in Tables 6 and 7, respectively. Figure 3 shows the locations of the monitoring stations on Dalton Canyon Creek in the Dry Gulch-Pecos River watershed which will be utilized as sites for monitoring specific conductance and TDS during the course of the Dalton Canyon Creek Project.

Table 6. Waterbody Attributes for the Dalton Canyon Creek Project

Waterbody	Assessment Unit ID	12-Digit HUC	12-Digit HUC Name
Dalton Canyon Creek	NM-2214.A_070	130600010205	Dry Gulch-Pecos River

Table 7. Dalton Canyon Creek Project Monitoring Stations established for the project

Station	Location	Monitoring
Dalton Canyon Creek Station 1	Adjacent to at the downstream end of the parking lot/camping area at the entrance to the canyon, in the same location as used by SWQB	Specific Conductance/TDS
Dalton Canyon Creek Station 2	Perpendicular to FR 123, 290 meters down the road from the sharp bend just below the intersection with Macho Canyon Rd	Specific Conductance/TDS
Dalton Canyon Creek Station 3	185 meters due east of the residential area boundary where it is closest to red roofed house	Specific Conductance/TDS
Dalton Canyon Creek Station 4	Adjacent to the end of FR 123 where it comes closest to the creek upstream of the residential area, and upstream of all planned project restoration activities, thus acting as a “control” for data collected within and downstream of the project area.	Specific Conductance/TDS

Specific conductance and TDS measurements will be taken at locations where flow is most likely to be consistent across the channel and throughout the monitoring field season (see SWQB SOP 7.0, Revision 1, effective date 4/7/2017, Section 6.0).

The field season is between March 15 and September 30 of each year. All baseline data collection and monitoring will occur during this time.

All monitoring sites are located on the SFNF. It is possible that the SFNF could be closed to the public during periods of extreme fire hazard. If this happens, Pathfinder Environmental and Keystone Restoration Ecology will work with the Pecos/Las Vegas Ranger District biologist, Danny Burton, to obtain a special access permit. This process has been used for monitoring access during past closures.

B.2 Sampling Methods

This study is intended to measure specific conductance using a conductivity meter that meets the standards of accuracy required by the SWQB standards. Measurement of specific conductance, as well as TDS, will be carried out in accordance with the procedures described by Radtke at al (2005). Temperature compensated specific conductance and TDS data will be collected using a YSI EC300A Conductivity Meter (accuracy +/-1 percent of reading +2 µS/cm, resolution 0.1 µS/cm) using a TDS factor of 0.67, which is the same factor used by the Dalton Canyon Creek TMDL. Data from the YSI meter will be copied to a monitoring data sheet in the field, then scanned and saved electronically on computers and an external online drive to minimize the chance of data loss by accidental loss of the field data sheets. A minimum of five readings at each monitoring station will be taken, as described by Radtke et al (2005) to ensure stable sampling conditions by consistent readings. This methodology will also serve to identify potential instrument problems so that corrective action may be taken before leaving the project site.

Flow measurements will be carried out at each monitoring station during each monitoring trip in accordance with SWQB SOP 7.0 (2015).

There are no plans to collect samples that would require outside analysis.

Table 8. Data Types for the Dalton Canyon Creek Project

Metric	Method	Tolerances (if applicable)
Specific Conductance	U.S. Geological Survey TWRI Book 9, 6.3 Specific Electrical Conductance, Version 1.2 (8/2005)	accuracy +/-1 percent of reading +2 µS/cm, resolution 0.1 µS/cm
Flow velocity	SWQB SOP 7.0 Stream Flow Measurement, Revision 1, Effective date April 7, 2015	N/A

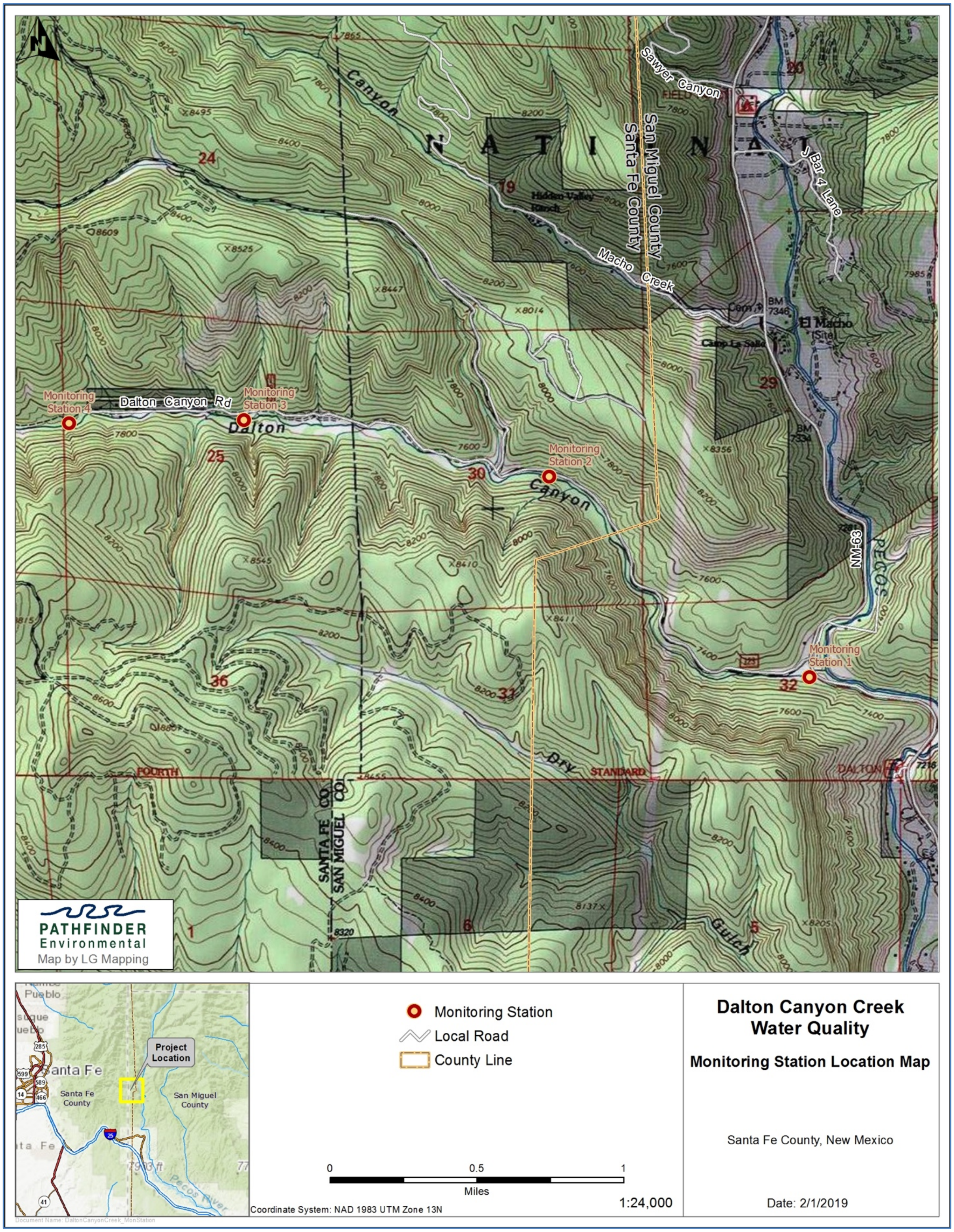


Figure 3. Project Area and Monitoring Stations

B.3 Sample Handling and Custody

Because there are no plans to collect samples for laboratory analysis, there are no handling requirements.

B.4 Analytical Methods

Because there are no plans to collect samples, no analytical methods are needed.

B.5 Quality Control

Specific conductance quality control will be assured by the selection of monitoring locations that have characteristics as described in the SWQB SOP (NMED/SWQB 2015). Monitoring devices will also be calibrated for accuracy prior to each monitoring trip to the field.

The chief source of data is measurements of specific conductance using the YSI EC300A Conductivity Meter. The QC activities relating to measurements are described in Sections B.6 and B.7 below.

B.6 Instrument/Equipment Testing, Inspection and Maintenance

The primary equipment needing maintenance, testing, and inspection is the YSI EC300A Conductivity Meter. This meter will be tested during calibration for accuracy and function according the directions provided by the manufacturer. The meter will be visually inspected for damage before and after each use and if any maintenance is necessary, it will be completed prior to the next monitoring trip. The velocity meter will be tested, inspected, and maintained in the same manner.

B.7 Instrument/Equipment Calibration and Frequency

It should be possible to show that all data was collected with a monitoring device that can be shown to have been properly calibrated. For this project, specific calibration requirements apply to the YSI EC300 Conductivity Meter and the velocity meter. The meters will be calibrated in accordance with the directions provided by the manufacturer prior to each monitoring trip. The YSI device will be calibrated using calibration solutions provided by YSI. A calibration record book will be maintained for each device throughout the life of the project. This data will also be maintained electronically in an MS Excel file spreadsheet. Documentation of calibration and verification will be maintained by Project Coordinator, Steve Vrooman at the Keystone Restoration Ecology office with a backup on an external online drive maintained by Pathfinder Environmental.

B.8 Data Acquisition Requirements

No outside data is required for this project.

B.9 Inspection/Acceptance for Supplies and Consumables

Calibration solutions obtained from the manufacturer for calibrating the YSI EC300A Conductivity Meter. There are no other supplies or consumables that could affect the quality of data related to this project.

B.10 Data Management

The UPWA Project Manager, David Lemke, will be responsible for data management. Data will be sent to the Project Officer, John Moeny, and will be stored on his computer and on a SWQB network drive.

All data will be converted to electronic format; hard copies of field sheets will be maintained in a project binder by Keystone Restoration Ecology and Pathfinder Environmental. Electronic data will be organized by assessment and date and will be stored and backed up on Pathfinder Environmental and UPWA computers and external backup drives online, respectively.

Group C: ASSESSMENT AND OVERSIGHT

C.1 Assessment and Response Actions

The Project Officer will provide project oversight by periodically assisting with and/or reviewing data collection efforts. A review of the data collection and monitoring efforts by the Project Officer will take place at the end of each monitoring season. The Project Officer will assess project progress to ensure the QAPP is being implemented, including periodic audits by the QAO, as needed. Any problems encountered during the course of this project will be immediately reported to the Project Officer who will consult with appropriate individuals to determine appropriate action. Should the corrective action impact the project or data quality, the Project Officer will alert the QAO. If it is discovered that monitoring methodologies must deviate from the approved QAPP, a revised QAPP must be approved before work can be continued. All problems and adjustments to the project plan will be documented in the project file and included in the final report.

C.2 Reports to Management

Quarterly reports will be submitted by the UPWA Project Manager, David Lemke, to the Project Officer and will include progress of project implementation and any available data. Printouts, status reports or special reports for SWQB or EPA will be prepared upon request. The final report will be submitted to the SWQB Project Office by the end of the grant period as indicated in the final, signed Intergovernmental Agreement. The Project Officer will be responsible for submitting the final project deliverables to EPA under this grant.

Group D: DATA VALIDATION AND USABILITY

D.1 Data Review, Verification and Validation

Data will be reviewed by Keystone Restoration Ecology, Inc (Steve Vrooman) or Pathfinder Environmental, LLC, (Devin Kennemore) prior to demobilization from the field site. Data will be considered usable if the requirements of this QAPP were followed and the data is within acceptable range limits as defined under this QAPP. Data that appears incomplete or questionable for the parameter will be flagged for review. Flagged data will be discussed with the Project Officer to determine the potential cause and usability. If a reasonable justification for use of the data cannot be attained, those data will be not used in analysis and implementation of restoration activities unless the data can be recollected and assessed for usability.

D.2 Validation and Verification Methods

The Project Officer will ensure that valid and representative data are acquired. Verification of field sampling and analytical results as performed by the Project Officer, will occur in the review of data. In the event questionable data are found, the Project Officer will consult with project personnel to determine the validity of the data. Results of the verification process will be included in the final reports. Data verification procedures will be used by Technical Consultant, Devin Kennemore, and reviewed by the Project Officer, as described in applicable subsections of Section 6.0 Step-by Step Process Description of the NMED SWQB (2016b) SOP.

D.3 Reconciliation with User Requirements

The user requirement is a restatement of the data quality objective: The quality of the data will be adequate to provide a high level of confidence of determining whether the Dalton Canyon Creek Project is meeting the project goals, as stated in the approved scope of work. If the project's results do not meet this requirement, then additional monitoring may be necessary to fill in data, which may include an extension of the monitoring period to measure effects that were not apparent during the project period. This would require a contract extension and additional funding from NMED.

REFERENCES

Bartholow, J.M. 2002. SSTEMP for Windows: The Stream Segment Temperature Model (Version 2.0). U.S. Geological Survey computer model and documentation. Available on the internet at http://www.fort.usgs.gov. Revised August 2002.

NMED/SWQB (New Mexico Environment Department/Surface Water Quality Bureau). 2013a. Total Maximum Daily Load (TMDL) for Upper Pecos Headwaters Watershed, Santa Rosa Reservoir to Headwaters. Accessed at: https://www.env.nm.gov/swqb/documents/swqbdocs/MAS/TMDLs/Pecos/Upper/2013/UpperPecosRiverTMDL.pdf

NMED/SWQB. 2013. Guidelines for Submission of Water Quality Data, Version 1.1. Approved March 20, 2013. https://www.env.nm.gov/swqb/DataSubmittals/Guidelines.pdf

NMED/SWQB. 2014. Nonpoint Source Management Plan. Resource Protection Division, Water Protection Section, Santa Fe, New Mexico, 87502. Available online at: https://www.env.nm.gov/wp-content/uploads/2018/02/2014_NPS_Management_Plan_FINAL.pdf

NMED/SWQB. 2015. Stream Flow Measurement. SOP 7.0, Revision 1, Effective Date: April 7, 2015. https://www.env.nm.gov/swqb/SOP/documents/SOP_7.0_Discharge_4-7-15.pdf

NMED/SWQB. 2016a. Standard Operating Procedures for Data Collection [SOPs]. Latest update: August 3, 2016. https://www.env.nm.gov/swqb/SOP/

NMED/SWQB. 2016b. 15.0 SOP Data Verification and Validation. Effective March 15, 2016 https://www.env.nm.gov/swqb/SOP/documents/15VVSOP03_15_2016.pdf

NMED/SWQB. 2018. New Mexico Environment Department, Surface Water Quality Bureau, Environmental Data Operations. Quality Management Plan. Approved by SWQB on: February 16, 2018. Approved by EPA on: March 1, 2018. Available online at: https://www.env.nm.gov/wp-content/uploads/2017/03/2019-SWQB-QMP-201802015-toc.pdf

Radtke, D.B., J.V. Davis, and F.D. Wilde. 2005. Excerpt from U.S. Geological Survey TWRI Book 9, 6.3 Specific Electrical Conductance, Version 1.2 (8/2005). Accessible online at: https://water.usgs.gov/owq/FieldManual/Chapter6/Final508Chapter6.3.pdf

APPENDIX

RECEIVING FORM

New Mexico Environment Department Surface Water Quality Bureau

Dalton Canyon Creek Project
Quality Assurance Project Plan
Acknowledgement Statement

This is to acknowledge that I have received a copy (in hard copy or electronic format) of the Dalton Canyon Creek Project *Quality Assurance Project Plan*.

As indicated by my signature below, I understand and acknowledge that it is my responsibility to read, understand, become familiar with and comply with the information provided in the document to the best of my ability.

____

Signature

____

Name (Please Print)

____

Date

Return to SWQB Project Officer (John Moeny)